

KOREAN CONFLICT

In 1950, with the imminence of the Korean Conflict, the government's posture changed again, and the military construction mission was returned to the Philadelphia District. The advent of the cold war strengthened the entire defense establishment (and its concomitant war-making potential) and brought about a whole new military defense program. The nation was alarmed by a Department of Defense projection that in 1952 the relative military strengths of both the U.S. and the U.S.S.R. would reach a point at which the balance of power would be most advantageous to the U.S.S.R.

The most significant military construction projects undertaken during that early cold war period included:

1. McGuire Air Force Base, New Jersey.
2. Dover, Delaware, Air Force Base (expansion).
3. Pittsburgh, Pennsylvania, Air Force Base.
4. Fort Dix, New Jersey (rehabilitated).
5. Camp Kilmer, New Jersey (rehabilitated).
6. Frankford Arsenal, Philadelphia, Pennsylvania (construction work).
7. Burlington Ordnance Depot, New Jersey.
8. Birdsboro Ordnance Depot, Pennsylvania.
9. Tobyhanna Signal Depot, Pennsylvania.
10. Pennsylvania Athletic Club, Philadelphia, Pennsylvania (Signal Corps).
11. Fort Monmouth, New Jersey (tremendous expansion).
12. *Nike* sites.
13. General Steel Castings, Eddystone, Pennsylvania (industrial facility).

AIR FORCE CONSTRUCTION: The character of the new military construction program was earmarked first by a significant increase in air force bases, with the purpose of rapidly expanding training and defense facilities for a growing air force.

Unlike similar construction during World War II, austerity was no longer the watchword. Instead, quality of construction became the logo for the new projects — and to the District's credit, high quality facilities were built — including four-man-per-room troop housing units to replace the old World War II open barracks.

These programs dating from 1950 included an initial \$6,400,000 housing, hangar apron, and navigation aid project at McGuire Air Force Base, New Jersey, which with supplements amounted to over \$55 million in total contracts by 1955; development of facilities at Dover Air Force Base to enable it to serve as the primary port of embarkation for all aerial cargos to our troops in Europe (1952) and further development of the Dover facilities (1952) as headquarters for the Atlantic Division of the Military Air Transport Service (MATS); work was also done at Pittsburgh Air Force Base, at a time when the Pittsburgh District was burdened with a heavy civil works schedule — the program was later returned to the Pittsburgh District as the Korean conflict waned.

Facilities installed by the District at the above air bases included: heating plants; infirmaries; barracks; administration buildings; petroleum, oil, and lubrication facilities to fuel planes; hangars; fire fighting facilities;

lighting systems; instrument handling systems; and radar.³⁶

CANTONMENT CONSTRUCTION: In the early stages of the Korean Conflict, great emphasis was placed on producing temporary facilities to meet the needs of a rapidly expanding military establishment. At Camp Kilmer, New Jersey, the Corps rehabilitated abandoned thousand-man Work War II barracks within *thirty days* (including housing, kitchens, and all other utilities). The schedule was met both at Kilmer and in a similar expansion project at Fort Dix.

After the initial housing units had been erected, a significant effort was made to upgrade standard troop housing, in 225-man reinforced concrete and cinder block barracks, with good quality well-finished interiors and no more than four men per room. "Unit integrity" was to be the new criterion for housing and messing facilities, replacing the old standard of providing the most efficient and cheapest facilities feasible. "Unit integrity" may be defined as a plan to locate an entire unit with messing facilities in one building, to create a feeling of *esprit de corps* among members of the unit. Psychological studies had shown that while the marines possessed this spirit to a high degree, the army did not. Individual soldiers tended to think of themselves as civilians in soldier suits; marines saw themselves as marines.

The studies found that early identification with a particular unit and the development of associations within it created the desired group feeling; whereas the army mobilized men on a mass production basis — sending them first through training camp, and then individually

out to fill quotas in a replacement center, from which they were sent to the front to fill casualty-caused vacancies. As a result of these studies, cantonment policy was changed and the new policy was implemented in all new cantonment construction in the District.

INDUSTRIAL CONSTRUCTION: At the beginning of the Korean Conflict, Army Ordnance reported a severe shortage of 75 mm, 90 mm, and 105 mm shells. Accordingly, a directive went out to the District to create a facility for manufacturing the needed shells at the Burlington, New Jersey, Ordnance Depot within *90 days*. The facility had been designed originally at a cost of \$42,000,000 in 1941 to produce aluminum, and was converted by the Corps at a combined construction and equipment cost of \$34,000,000. The shells were the first in this country to be made of steel (not brass, which was in short supply), a material which had been used successfully by the Germans in the Second World War. Through a unique cold-drawn process, steel discs were extruded into shell casings. The shells were then heat-tempered to distribute the molecules evenly, and the red hot 1800° shells cooled with water which had to be maintained at a temperature of not less than 55° nor more than 70°F. The District designed and successfully built the entire facility from scratch, although not within the 90 day time limit.

Developing strategy in Korea emphasized the use of tanks in battle. The new M-48 medium tank required one piece castings for both the hull and the turret (unlike older models, cast in separate pieces and then joined together). A facility for this express



M-48 Patton Medium tank.

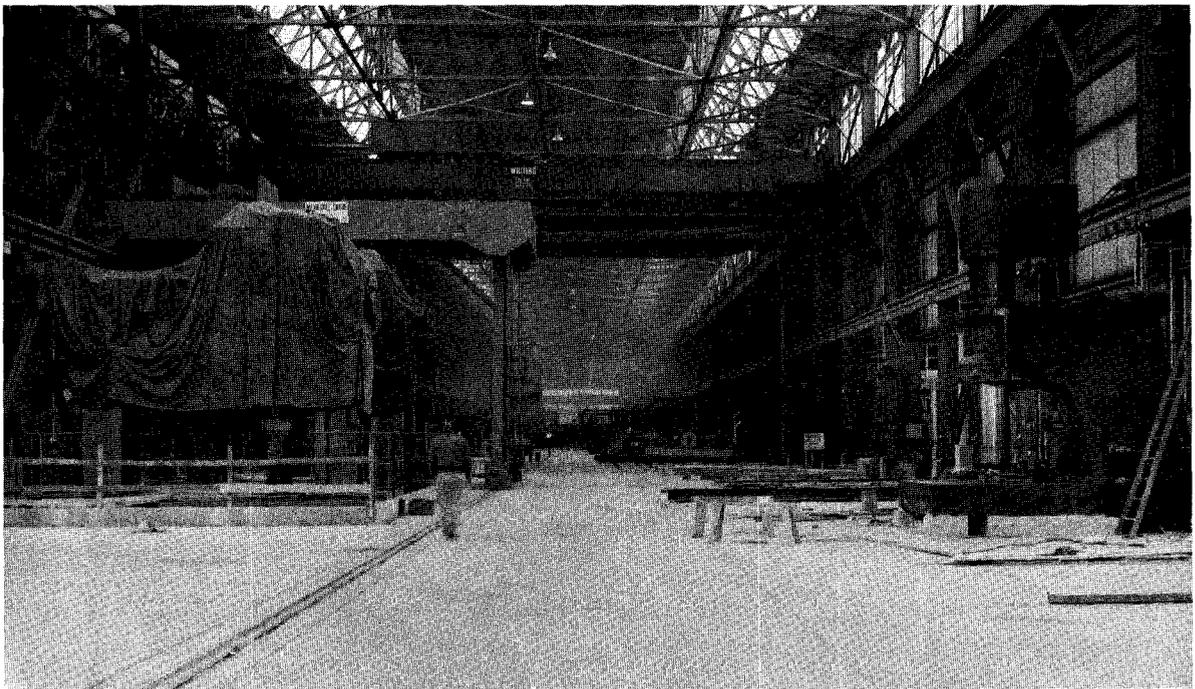
—U.S. Army Photograph.

purpose was created by the District at the old Navy steel castings foundry at Birdsboro, Pennsylvania. A cost-plus-fixed-fee type contract was awarded for this project on 7 March 1952. Plans for the \$23 million facility required the most advanced furnace design possible, with an extremely high order or quality control in the casting process (including a special Betatron building with massive 24 million volt X-ray testing facilities). The Main Foundry Extension and Heat Treatment Building were monumental structures 400 feet wide by 575 feet long and 188 feet wide by 907 feet long, respectively.

A smaller, similar facility was developed at General Steel Castings, Eddystone, Penn-

sylvania. Work at these facilities was performed at an accelerated rate. When the facilities were two-thirds finished, the end of the Korean Conflict was in sight. The Birdsboro contracts were finally completed on 1 June 1954 at a total contract cost of \$23,268,879.³⁷

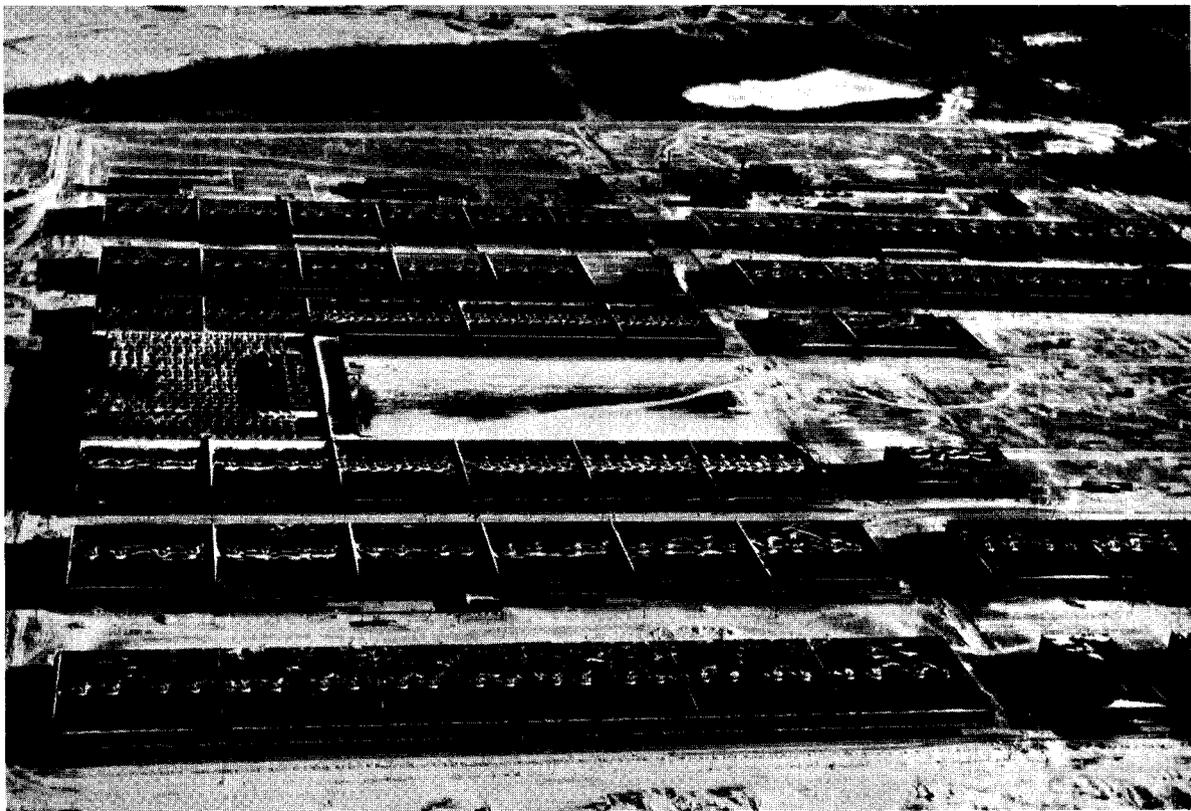
SIGNAL CORPS FACILITIES: Prior to and during the Korean Conflict, the army determined to expand Signal Corps facilities to make it possible for the Signal Corps to support field forces with the myriad spare parts required to service the electronic gear and components used by a modern army. The Philadelphia District was engaged in several key projects on behalf of the Signal Corps.



Birdsboro Foundry, the east bay looking west, January 1954.

1. Pennsylvania Athletic Club: The District was requested to acquire this facility on Rittenhouse Square in central Philadelphia and convert it to modern office space, to house a Signal Corps facility that would maintain inventory control and warehouse stock level control over items of Signal Corps equipment. The

\$25 million. The 275 acre site was to be located on 1419 acres of land near Scranton, in a move to stimulate employment in a depressed area. The site selection was made with full recognition of the difficulties inherent in the construction. Mountainous terrain had to be levelled to provide sufficient flat area for



Aerial view of the Signal Corps Depot at Tobyhanna, Pennsylvania.

need for the facility was so pressing that condemnation proceedings were instituted, and the District was directed to convert the entire building within thirty days, through a cost-plus-fixed-fee contract negotiated with the Turner Construction Company.

2. Tobyhanna, Pennsylvania, Signal Corps Depot: The Tobyhanna Depot was designed in January 1951 as a primary backup warehousing facility, at a cost of

optimum warehousing. The job went forward under extreme pressures. Shortcuts were taken. Concrete was poured in this, the coldest spot in Pennsylvania, even during severe winter weather, when such work is suspended. Ultimately, large cracks were discovered in the spandrels and beams of a section of the roof of the administration building. Cores were taken through the beams and the area was sealed off for safety. Later inspection revealed serious deficiencies

Members of Battery D, 707th Gunnery Battalion, Philadelphia, Pennsylvania, prepare to fire a 90mm AA gun.

—U.S. Army Photograph



in the concrete. Discovery of small-time pilferage at the site led to a Department of Justice investigation of the entire project, which resulted in a series of indictments being returned against contractors, a union business agent, a congressman, the congressman's assistant, the architect-engineer and the District's Resident Engineer at the project. The indictments involved conspiracy to defraud the government, bribery, and conspiracy to violate the labor laws. The Resident Engineer and labor representatives were eventually convicted on separate counts of wrongdoing, but the Resi-

dent Engineer's conviction was voided on appeal. The \$32 million facility was fundamentally complete by the end of 1954 and is currently in service.

Aside from the Burlington and Birdsboro projects, which were awarded as cost-plus-fixed-fee contracts, the general architect engineering contracts negotiated during this period were of two types: The Title I contract, in which a lump sum for design specifications and estimates was negotiated with a specific architect-engineering firm; and the Title II contract, which contained an option for inspection and was also negotiated with an architect-engineering firm.



Nike missile site at Newportville, Pa. showing four Nike-Ajax missiles raised on launcher, 24th Artillery Group, Philadelphia, Pennsylvania. Defense, 20 October 1959.

—U.S. Army Photograph

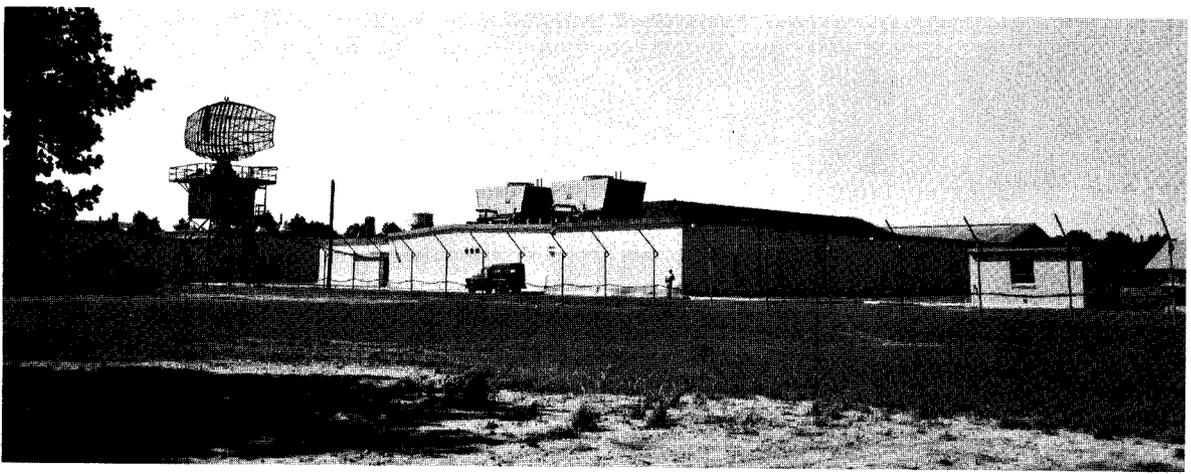


Firing of Nike-Hercules Anti-Aircraft Missile. —U.S. Army Photograph

After the termination of the Korean conflict, the major military construction contracts engaged in by the District primarily involved artillery and missile defense contracts for the Philadelphia metropolitan area, and military housing contracts for major area bases.

Immediately following the Korean conflict, the Corps was ordered to develop a ring of twelve anti-aircraft gun emplacements situated around the clock at a radius of six to seven miles from central Philadelphia. This was followed by an authorization to develop an outer defensive ring, this time at a distance of twenty-five miles from central Philadelphia, of *Nike-Ajax* anti-aircraft missiles. These missiles were to form one link in a defensive chain reaching up and down the East coast and ringing the major cities. Up to the time of this construction, "*Nike*," name of the Greek goddess of victory, was a

verboten word, and construction proceeded under heavy security. The *Ajax* armaments were eventually declared obsolete, and were ordered replaced by the newer, more advanced *Nike-Hercules* generation of defensive missile. The District was ordered to convert all twelve sites for the *Nike-Hercules*, with four sites to be fully and eight sites partially converted. Warheading buildings were constructed at each of the four chief *Hercules* sites. These sites were computer connected by long-range radar scanning devices into a major overall network integrated by a major headquarters located in Pedricktown, New Jersey. This facility, dubbed "*Missile Master*" was designed and built by the Philadelphia District "for the purpose of high speed coordination of defense warnings and fire power for all tactical facilities in the Philadelphia Defense Area and coordination on a larger plane of the east coast region."³⁸



"Missile Master," Pedricktown, New Jersey.

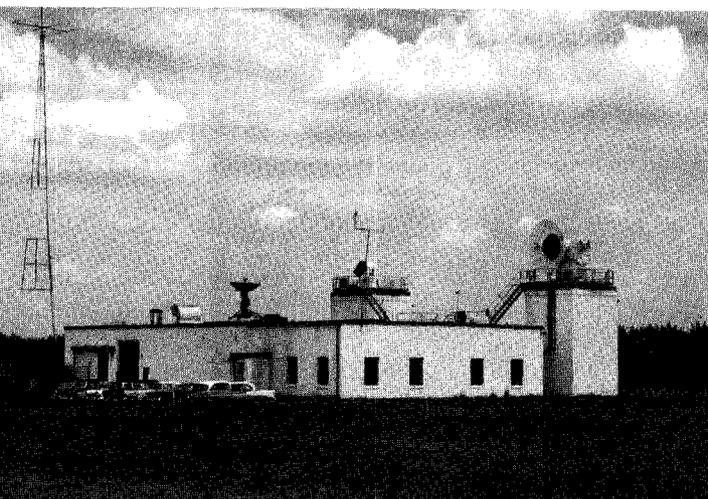
NIKE: It should be remembered that in the mid-1950's the intensity of the cold war was so great that a genuine fear of a possible nuclear attack by enemy aircraft permeated the air. The nation's initial reaction was a frantic attempt to encircle our major cities with a ring of iron, an attitude which later gave way to a policy of retaliation rather than a posture of total defense. The nation knew that Russian bombers had the capability of reaching the United States. Consequently, the *Nike* defense — in all three generations, *Nike-Ajax*, *Nike-Hercules*, and *Nike-Zeus* (never implemented under the District) were developed — together with the most advanced target acquisition radar facilities, to identify, track, lock in and destroy enemy targets

automatically. All flight plans nation-wide were checked and evaluated by computer. The missiles were stored underground and were provided with elevators to raise them to firing position. During the construction phases of the project, the emphasis was on speed of construction, at premium cost plus overtime. These sites were first manned by the air defense artillery, then turned over to the National Guard for training purposes. Finally declared surplus, the *Nike* installations are now considered obsolete.

In conjunction with the missile defense programs, a new missile ranging facility, the DAMP (Downrange Army Missile Program) structure was erected at Moorestown, New Jersey.

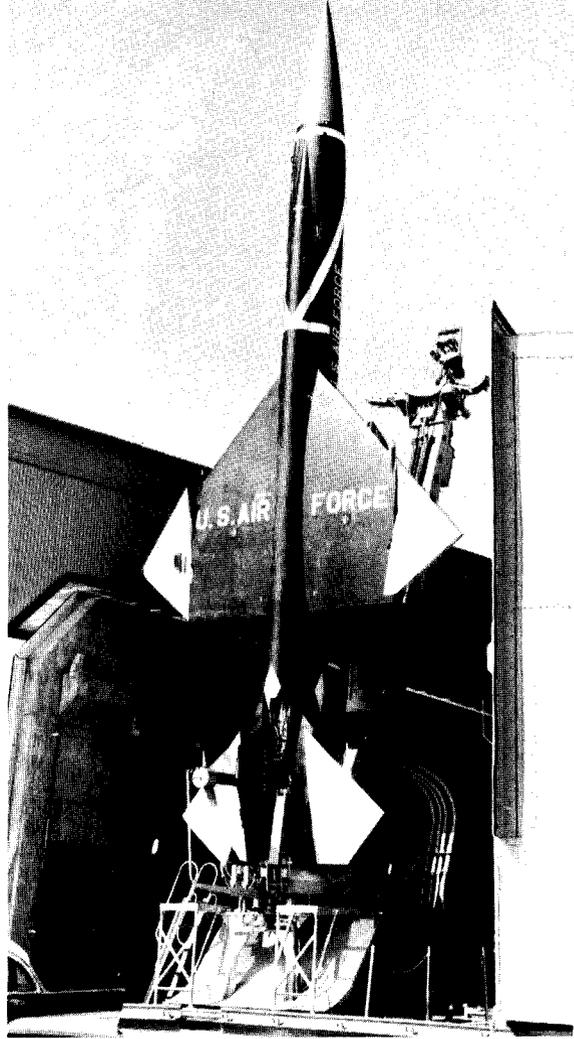
BOMARC: Extending the missile defensive ring outward, the 300 mile range *Bomarc* (liquid-fueled and twin-ramjet powered) guided missile program was designed to intercept enemy aircraft before they reached American shores. Forty-seven feet long, with a wing span of eighteen feet, two inches, the missile weighed 15,000 pounds at take-off. The first *Bomarc* installation in the nation was activated at New Egypt, New Jersey, between Fort Dix and Lakehurst Naval Air Station. The sites were designed for wider diffusion than the *Nike* installations, with the next closest *Bomarc* facility located in Long Island.

Although the *Bomarc* eventually proved to be a less than successful missile defense

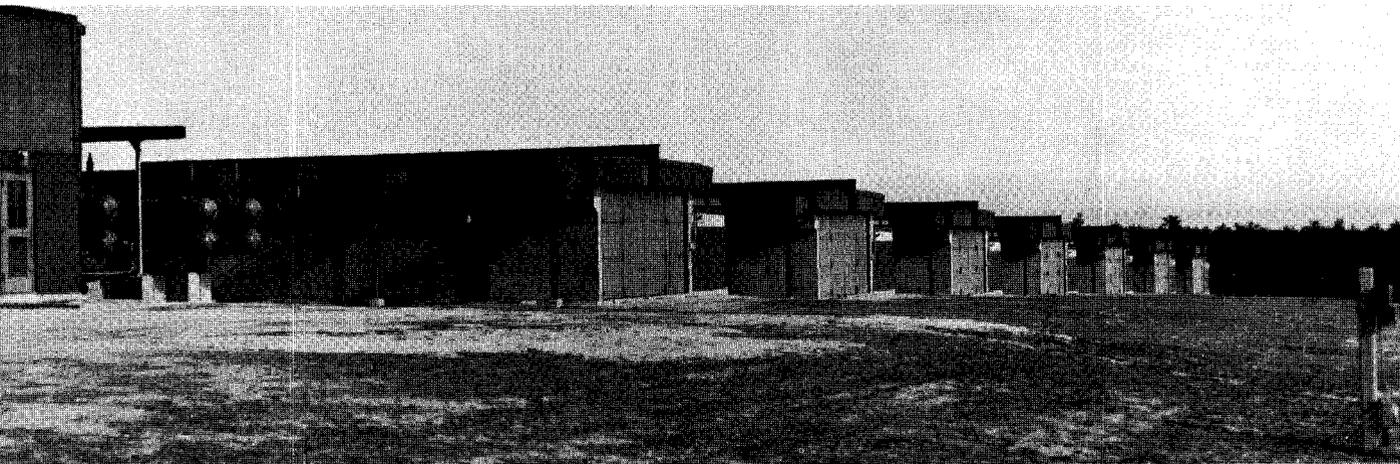


The D.A.M.P. (Downrange Army Missile Program) building at Moorestown, New Jersey.

Bomarc missile, elevated and ready to fire. Note the massive open steel doors.



system (a number of test firings were failures), it was pushed as a propaganda defense against Russia. The District built the hardened missile shelters and their ancillary buildings; construction began in January 1958 and took two years for the first increment of fifty-six launcher structures. The project was considered so essential that construction was ordered to proceed at top speed, without all engineering problems completely worked out; however, it proved to be so complicated that many on-the-job engineering changes required and put into practice by Roscoe-Ajax and other contractors, resulted in litigation, which, as of December 1971, had not yet been finally resolved. The litigation emerged from difficulties inherent in the development of the massive steel doors required for each missile housing. Each leaf of this bi-parting roof structure, sixty feet long by twelve feet wide, weighed ten tons, and the door mechanism was designed to move those twenty tons and raise the missile into firing position



Bomarc installation at New Egypt, New Jersey, with missile launching structures and powerplant.

within ten seconds. To produce a workable mechanism, changes were made in the pre-negotiated contract specifications. The changes worked, but differences arose as to the cost of the project, and these ultimately resulted in the previously mentioned litigation. When military construction was transferred from the Philadelphia District to the New York and Baltimore Districts in October 1960, *Bomarc* and *Nike* were among the major continuing programs transferred. The introduction of the ICBM in the early 1960's rendered both of these systems obsolete.³⁹

In a minor way, the District was also engaged at the time in expanding and developing the Beverly National Cemetery in Beverly, New Jersey, grading and draining, and erecting the administration building at a facility which at the time of its transfer to the New York District (1960) was averaging eight burials per day. At the same time, the District worked on a number of reserve training center armories (Wissahickon Avenue Armory, Philadelphia, Pennsylvania; Willow Grove Armory, Norristown Armory, Pennsylvania; Atlantic City Armory, New Jersey).⁴⁰

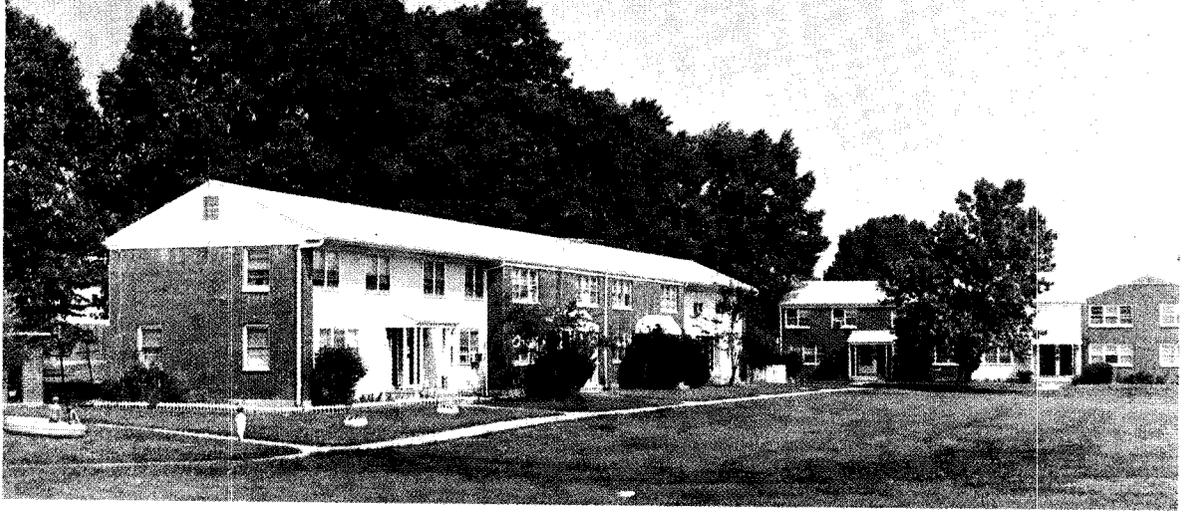


Beverly National Cemetery, Beverly, New Jersey.

MILITARY HOUSING: The last major military construction projects worked on by the District were for expanded and improved housing facilities at military bases. Under provisions of the continuing MCA (Military Construction, Army) housing program, the District built 100 NCO; 100 company grade; and 78 field grade housing units at Fort Dix, New Jersey in 1956, at a cost of \$6,800,000. Four hundred units had previously been built at Fort Dix under the authority of the special Wherry Housing Act, which enabled private contractors to build family housing on government land (which they leased for 99 years)



M.C.A. Housing, Fort Dix, New Jersey.

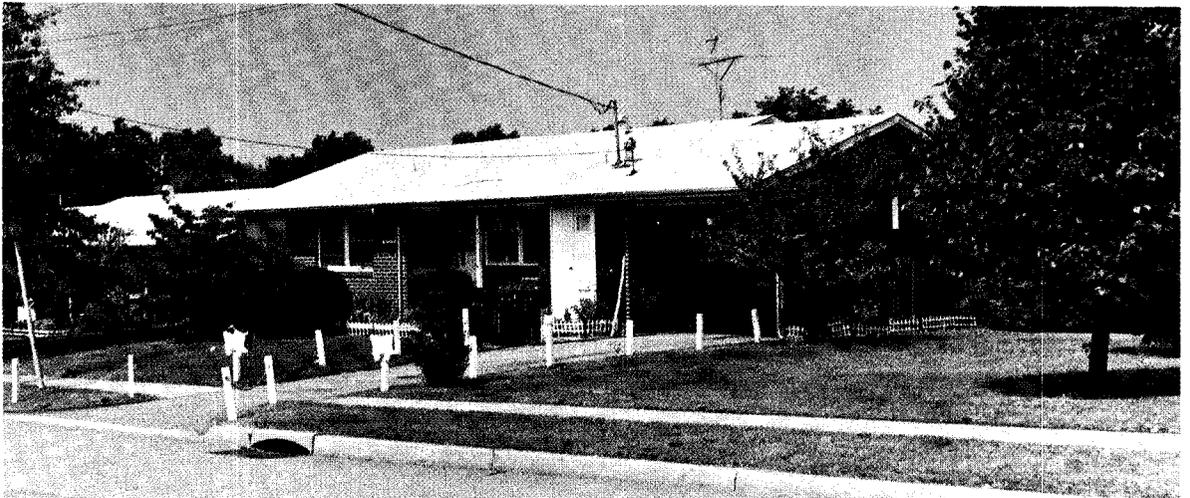


Wherry Housing, Fort Dix, New Jersey.

with an FHA (Federal Housing Administration) commitment based on a government guarantee to keep the housing filled. The project included 292 enlisted men's units; 98 company grade officer's units, and 10 colonel's quarters, built in 1954-55 at a cost of \$5,000,000. The buildings were multiple-family dwellings, with carefully legislated spending limits on both enlisted men's and officer's housing, which the army had some difficulty in meeting. The Philadelphia District was given the responsibility of inspecting this construction.

The Capehart Housing Act of the 84th Congress, which in a sense superceded the Wherry bill, provided for family housing of a more individual nature. An all-government project, it was designed to make government housing on military bases as attractive to

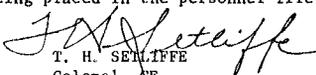
military personnel and their families as possible within the fiscal limits of the program. At Fort Dix, from 1957 to 1959, the Corps contracted for and built living quarters for the families of 702 officers and men, in 351 separate buildings. These included 172 two bedroom units for Company Grade Officers; 174 three bedroom units for Company Grade Officers; 178 two bedroom units for Non-Commissioned Officer; and 178 three-bedroom units for Non-Commissioned Officers. All units were without basements.⁴¹ During 1957, 1958, and 1959, the Philadelphia District completed \$23,364,492; \$24,929,478; and \$47,773,189 in military construction projects respectively (including over \$11,500,000 in Capehart housing⁴²). In early 1960, authorization was granted for the construction of 200 additional Capehart units at Fort Dix.



Capehart Housing, Fort Dix, New Jersey.

Before all construction at Dix could be completed, however, the military construction mission of the Philadelphia District was ordered transferred to the New York and Baltimore Districts, effective 1 July 1960. Engineers in the field, working on such programs as *Bomarc*, *Nike*, Fort Dix, and

McGuire Air Force Base were ordered to finish what work they could by 1 July and to box and ship whatever they could not finish by that time to New York or Baltimore. The following memorandum concerning the transfer was ordered placed in the personnel files of all employees of the Philadelphia District.

DISPOSITION FORM		<small>SECURITY CLASSIFICATION (if any)</small>	
<small>FILE NO.</small>	<small>NAPVE</small>	<small>SUBJECT</small>	<small>DATE</small>
		Military Construction	25 May 1960
<small>TO</small>	<small>FROM</small>	<small>DATE</small>	<small>COMMENT NO. 1</small>
All Members, Philadelphia District	District Engineer	25 May 1960	
<p>1. I feel the Division Engineer's personal letter to me, 23 May 1960, is one properly the concern of every member of the District. I particularly invite your attention to the second paragraph.</p> <p style="padding-left: 40px;">"Dear Colonel Setliffe:</p> <p style="padding-left: 40px;">The present foreseeable dollar value of work of military construction within the Philadelphia District area is so small that it cannot economically justify further assignment of military construction to the Philadelphia District. It has been determined, therefore, that the military construction in eastern Pennsylvania and Delaware be transferred to the Baltimore District, and that in New Jersey to the New York District, effective 1 July 1960. Civil Works construction and Military Procurement, which form a large part of the Philadelphia District workload, will continue to be assigned to your office.</p> <p style="padding-left: 40px;">I realize that this action will result in a reduction in force of Civil Service personnel primarily in the District Office. The personnel of your District have done a splendid job in military construction work since its assignment at the beginning of the Korean conflict. Please express my appreciation and inform them that it is with regret that this action has to be taken. Every possible effort will be made by my staff to place within the Corps of Engineers' offices in other areas those individuals who must leave your District but who wish to remain with the Corps of Engineers.</p> <p style="text-align: right; padding-right: 40px;">Sincerely yours,</p> <p style="text-align: right; padding-right: 40px;">/s/ T. H. Lipscomb T. H. LIPSCOMB Brigadier General, USA Division Engineer"</p> <p>2. A copy of this Memorandum is being placed in the personnel file of every member of our District.</p> <p style="text-align: right; padding-right: 40px;"> T. H. SETLIFFE Colonel, CE District Engineer</p>			

DD FORM 1 FEB 60 96

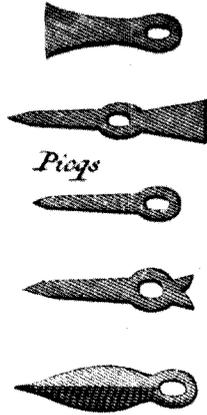
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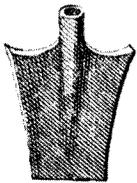
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On 1 July 1960, almost a hundred years and hundreds of millions of dollars of District Military construction ended. Many of the most vaunted programs have since faded, new technologies carrying within them the necessary obsolescence of the old, but the record of the Philadelphia District still stands, proud in its accomplishment and secure of its place in the history of military engineering.

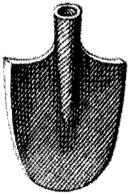
Outils et Materiaux.



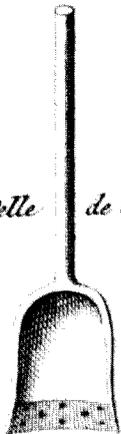
Piqqs



Pelles



Pelle de bois

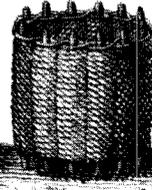
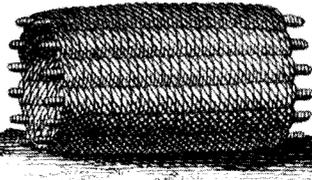


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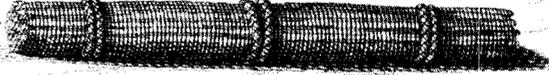
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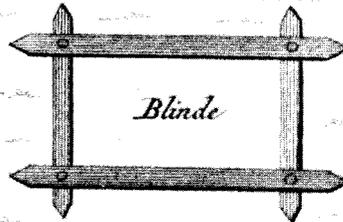
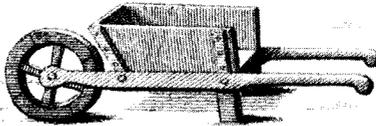


Sacs a terre



Poutier

Brouette



Blinde



Chandeliers

Eighteenth Century engineer tools and materials including picks, gabions, sandbags, wheelbarrows, hatchets, stakes, obstacles and spades. From Vauban's "Memoire pour servir d'instruction dans la conduite des sieges et dans la defense des places." Leiden, 1740.

—University of Pennsylvania